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Where the growth is colorless, not very dense and peculiar for the fineness of its meshes or radiations, it would be difficult to photograph the colonies by ordinary methods of exposure, since there is little difference in color between the medium and the object.

A sensitive plate in an ordinary camera exposed to a plate culture by perpendicular rays of transmitted light shows little differentiation between the medium and colonies after development. The differentiation is also weak in the ground glass.

When, however, the perpendicular rays of light are cut off, and oblique rays from several directions are thrown through the plate culture upon the sensitive plate, the colonies are differentiated strongly in all their exquisite forms and tracings. The culture plates (Petrie dishes) or tubes, are inserted in an opening in the end of a box, which is painted perfectly black on the inside. Sliding boards, in a grooved frame, each cut to clamp over half the Petrie dish and lined with black velvety stuff hold the plate culture in position. The lens of the camera is pointed toward a window with the plate culture between. A perfectly black screen, 30 cm. to 40 cm. in diameter is then hung upon the window directly in front of the object in order to cut off the perpendicular rays of light.

BOTANICAL DEPARTMENT, CORNELL UNIVERSITY.

Crossing of Cucurbits.*

BY L. H. PAMMEL.

So widespread is the popular belief that several members of the genera *Cucurbita*, *Cucumis* and *Citrullus* will hybridize and "mix," that it is difficult to convince people of these errors. What is more surprising is that these opinions should find support among a certain class of popular scientists. It is scarcely necessary to repeat experiments of this kind, after the diligent work of Naudin, Bailey, Munson and others who have all demonstrated the absurdity of this popular error. In a paper read before the Association of Agricultural Colleges and Experiment Stations, the writer gave the result of a large number of careful hand pollinations made in 1892. These were to the effect that the different species do not "mix." Attention was called to the ease with which crosses could be obtained with nest-egg gourd and other varieties. All of the crosses obtained last year have been cultivated during the present season, and a short report on these may not be amiss.

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*Read by title before the Section of Botany, A. A. A. S., Madison Meeting, August, 1893.

It may be stated with positiveness that none of the seed of numerous varieties of *Cucurbita maxima* show any trace of *C. Pepo* or other cultivated genera. *Citrullus vulgaris* in numerous varieties show no trace of *Cucurbita Pepo*, *Cucumis Melo* and *C. sativus;* nor does *C. sativus* show any trace of *C. Melo* when pollinated by insects.

The different forms of *Cucurbita Pepo* intercross readily; not only was this shown in our hand pollination trials of last year, but our mixed seed has given us few specimens that are true to type.

A few illustrations will suffice.

Common Pumpkin on Long Warted produces a creeping vine less vigorous than Common Pumpkin, with leaf somewhat like the Long Warted. Fruit orange yellow, from four to six inches in diameter, smooth, without any indications of warts.

Vegetable Marrow on Long Warted: A long, slender running vine, something of the type of Vegetable Marrow; fruit golden yellow, or of cream color, elongated, two to four inches in diameter, all of them warted.

Common Pumpkin on Nest-egg Gourd: Leaf and vine of Nest-egg Gourd; color of fruit like Nest-egg Gourd, much elongated and larger than Nest-egg Gourd.

Common Pumpkin on Perfect Gem: Leaf and vine of Perfect Gem; color of fruit creamy yellow, but form and size approaching Pumpkin.

A mixed lot of seeds of Italian Striped show some of the leaf characters of Italian Striped; the stem is fleshy, as in the original, but it is a creeper, not bushy in its habit, as originally. The fruit is short, color orange yellow, and approaches Common Pumpkin.